

**Remarks**

In view of the above amendments and the following remarks, allowance of the case is respectfully requested.

Claims 2, 3, 9-16, 22, 35-40, 42, 44, and 45 have been canceled without prejudice. Claim 46 has been added, and claims 1, 4, 17, 34, and 41 have been amended. Consequently, claims 1, 4-8, 17-21, 23-34, 41, 43, and 46 are currently pending and under consideration.

Since claims 36-40 and 45 have been canceled solely to speed prosecution, it is believed that the objections to these claims on pages 2-5 of the Office Action have been obviated.

**Independent Claim 1**

Independent claim 1 has been amended to incorporate the features recited previously in dependent claims 2, 3, and 10 as well as has been amended to further refine the recited features. As a result, dependent claims 2, 3, 10, and 11 have been canceled, and it is believed that no new matter has been added.

Independent claim 1 recites a technique in which a knowledge-base system is able to detect email messages that were sent in reply to a previous messages generated by the system so that the reply can be forwarded to a human representative to handle. As mentioned before, customers can become quickly frustrated by having their repeated questions not answered correctly by an automated FAQ system. The recited technique addresses this issue by providing a way to readily identify replies by customers and forward the replies to the proper human representative so that the correct answer can be given. For example, customers might contact the knowledge base system in multiple, disconnected emails about different questions. For instance, a customer might inquire about issue A at 2:00 p.m. and the system could respond with an automated reply answer at 2:05 p.m. Then, at 4:00 p.m., the same customer might

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inquire about a different issue, issue B, to which the system might also respond with an automated reply at 4:05 p.m. Finally, the customer might follow-up on the response about issue A at 6:00 p.m. by replying to the automated message he or she received at 2:05 p.m. When a response to an email previously generated by the system is received, the system should in most cases forward the message to a human representative in order to have the issue addressed. Therefore, the knowledge-base system must be able to distinguish between the two previously sent messages, the 2:00 p.m. and 4:00 p.m. message, so that it properly handles the message. In order to do so, it cannot simply rely on looking up the customer's name or email address in a database of previous interactions. In this example, notice that the biggest difficulty for the system is realizing that the message at 6:00 p.m. is about the "same" issue as the message at 2:00 p.m., but not about the same thing as the message at 4:00 p.m. This is difficult because the customer making contact is not constrained in any way about how they choose to word their inquiries, so it cannot be assume that the messages will share the same keywords or even the same subject lines. Indeed, the customer may even inquire at 6:00 p.m. from a different email account than they used for their 2:00 p.m. inquiry. For instance, a customer might forward the email to another account and then send a reply, which would then have a different email address. To solve this problem, the inventors developed a scheme of embedding a message identification number into each automated response so that the system is able to identify replies to previous messages.

It is believed that independent claim 1, as amended, is allowable over the references of record. On page 3 of the Office Action, dependent claim 3 was "rejected under 35 U.S.C. 103(a) as being unpatentable over McAndrew in view of US Pat No 5,619,697 issued to Nishida." These cited references fail to disclose all of the features recited in claim 1, such as "enclosing a message identification number in a first email sent by the knowledge-base system that provides an answer to a question, wherein the message identification number uniquely identifies the first email" and "determining the second email from the client computer was a reply to the first email from the

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knowledge-base system based on the message identification number contained in the second email." As should be recognized, McAndrew fails to disclose or even suggest enclosing a message identification number in an email that uniquely identifies the email. It also should be clear that none of the problems described in the example of the preceding paragraph would arise in the system described by McAndrew, and thus, McAndrew fails to provide any motivation to arrive at the technique recited in claim 1.

Likewise, Nishida fails to remedy the above-mentioned missing features because Nishida fails to disclose using a message identification number that identifies a previously sent email message. As shown in FIG. 4, the identification number (I1) described in Nishida identifies the processor sending the message and does not identify the message itself or the content of the message. In other words, Nishida's processor is analogous to the client in recited technique, and the processor identification number (I1) is analogous to the name or email address of the client. As discussed above, the email address of the client (or the processor) alone is not sufficient for the system to distinguish between different replies to messages. Moreover, Nishida fails to provide any motivation to arrive at the technique recited in claim 1. Since both references fail to disclose or suggest all of the features, claim 1 is non-obvious in view of these references. For this and other reasons, it is submitted that claim 1 and its dependent claims are allowable over the references of record.

#### Independent Claim 17

Independent claim 17 has been amended to incorporate the features recited previously in dependent claim 22 as well as has been amended to further refine the recited features. As a result, dependent claim 22 has been canceled, and it is believed that no new matter has been added.

As should be recognized, claim 17 concerns a technique for selecting question-answer sets by evaluating the presence of a word from a query differently between the questions of the question-answer sets and the answers of the question-answer sets. As described on page 14 of the present application, under certain circumstances words in

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questions may generate more or less accurate results than those contained in the answers. By grading the answers and questions differently, the accuracy of the answers generated by the system often improves. As discussed on page 25 of the application, the scores generated from evaluating the questions and answers differently are obtained for each question-answer entry (or pair) as a result of matching query words to the entry. Statistical measurements of these scores can be used to determine the answer reported from the query. One type of statistical measure of the scores can be a variability measure, such as the standard deviation of the distribution of the scores. The variability of the scores over all of the entries is used to determine the statistical significance (in the technical sense of the phrase) of the score of any particular entry, allowing the system to return entries that "stand out" from the rest of the entries based upon their scores. These statistics are determined automatically by the system for each query. The system can set how much an entry's scores must stand out (the "significance level") as a minimum threshold for including the entry in a response. For example, in the embodiment described on page 25 of the application, a threshold level based on a value of two standard deviation units can be designated. That is, only Q/A entries with scores greater than two standard deviation units above the mean score would be selected and outputted to the person asking the question.

It is believed that independent claim 17, as amended, is allowable over the references of record for a number of reasons. On page 16 of the Office Action, claim 22 was "rejected under 35 U.S.C. 103(a) as being unpatentable over McAndrew in view of Pub No 2002/0049752 issued to Bowman et al." However, it is submitted that the cited references fail to disclose all of the features recited in claim 17, such as "wherein said selecting includes scoring the question-answer sets to create a distribution of scores and determining with the system the query result based upon variability of the scores" (emphasis added). As mentioned before, the variability of the scores over all of the entries is used to determine the statistical significance of the score of any particular entry, allowing the system to return entries that "stand out" from the rest of the entries based upon their scores. The Office Action recognized that

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McAndrew fails to disclose such a feature. It is further submitted that Bowman, likewise, fails to disclose that the query results are determined based on the variability of the distribution of scores. Paragraph 18 of Bowman was cited as disclosing such a feature, but nowhere has it been found that Bowman describes using the variability of the distribution of scores for question-answer entries (or pairs) to determine the query result. Contrary to the recited technique, the ranking system in Bowman is based upon how often an item (entry) has been chosen by users in the past, as opposed to how much the entry stands out from the rest of the entries right now. Since both references fail to disclose or suggest all of the features, claim 17 is non-obvious in view of these references. For this and other reasons, it is submitted that claim 17 and its dependent claims are allowable over the references of record.

#### **Independent Claim 34**

Independent claim 34 has been amended to incorporate the features recited previously in dependent claim 35 as well as has been amended to further refine the recited features. As a result, dependent claim 35 has been canceled, and it is believed that no new matter has been added.

As discussed on page 25 of the present application, the knowledge base system allows the threshold limits for scores to change dynamically. That is, the thresholds can be based on some statistical measurement of the distribution of scores, such as the mean and measures of variability, like standard deviation units. For example, if the dynamic threshold level was two standard deviation units, then only Q/A entries with scores greater than two standard deviation units above the mean score would be selected. The scores of "good" Q/A entries are not always in the same absolute threshold range for different questions, because the scores vary due to the length of the question, and the number of Q/A entries in the database. The dynamic thresholding returns "good" answers and minimizes the occurrence of "false positive" results, which are irrelevant Q/A entries that do not adequately answer the question.

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It is believed that independent claim 34, as amended, is allowable over the references of record for a number of reasons. On page 21 of the Office Action, claim 35 was "rejected under 35 U.S.C. 103(a) as being unpatentable over McAndrew in view of US Pat No 6,443,840 issued to Von Kohorn (hereafter Von Kohorn) and further in view of US Pat No 6,270,456 issued to Iliff (hereafter Iliff)." For example, none of these references disclose or suggest "determining a threshold limit based upon said scoring with the system, wherein said determining includes calculating variability of scores from said scoring, and basing the threshold limit on the variability of the scores." It should be readily appreciated that McAndrew and Von Kohorn fail to disclose this feature. Nevertheless, the Office Action alleged that Iliff described such a feature. However, Iliff does not describe the dynamic determination of this threshold based upon the variability of the scores in the result set. Rather, Iliff uses a fixed threshold designated by a person. Specifically, column 17, lines 13-14 of Iliff states that "if it [the score] reaches a threshold defined by the question's author, the this physician will say that the patient has the symptom of depression" (emphasis added). The recited technique allows the system itself to define the threshold in an intelligent way. As mentioned previously, the threshold is dynamic – that is, it is not fixed but varies query-by-query based upon the statistics of each individual query. This addresses many problems inherent in a thresholding scheme based upon a fixed score, particularly problems related to choosing an appropriate threshold level for all variety of query lengths. Since the combination of references fail to disclose all of the features recited in claim 34 as well as for other reasons, independent claim 34 is allowable over the references of record.

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**Independent Claim 41**

Independent claim 41 has been amended to incorporate the features recited previously in dependent claim 42 as well as has been amended to further refine the recited features. As a result, dependent claim 42 has been canceled, and it is believed that no new matter has been added.

It is believed that claim 42 as amended is allowable over the references of record because the cited references fail to disclose all of the features recited in claim 42, such as "means for selectively hiding words in the response to the FAQ database query, wherein a hidden word causes an associated question-answer entry to be always included in the response while the hidden word remains invisible in the response." As discussed on pages 19- 20 of the present application, hidden words in an entry can still contribute to the entry's match score, but do not show up when the response is sent to a query. The advantage of this is that certain words in a query can be configured to automatically trigger the use of a FAQ entry in a response without themselves being present in the response. One use for this is the ability to specify a set of profane words that will automatically trigger the use of a special entry in response to a query containing profanity, but the response itself would not contain any of these profane words. None of the cited references disclose such a hidden word feature. For instance, although U.S. Patent No. 5,278,980 to Pedersen et al. at column 11, lines 42-50 describes the use of ignore words, Pedersen fails to describe the use of hidden words. For this and other reasons, it is submitted that independent claim 41 and its dependent claims are allowable over the references of record.

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**Conclusion**

It is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. It should be understood that the above remarks are not intended to provide an exhaustive basis for patentability or concede the basis for the rejections in the Office Action, but are simply provided to overcome the rejections made in the Office Action in the most expedient fashion. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the applicants' undersigned representative.

Respectfully Submitted,

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